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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/669,055	09/24/2003	Yoshiaki Noda	NOG-0017	3382

23353 7590 09/18/2006

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EXAMINER
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ARANCIBIA, MAUREEN GRAMAGLIA

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 09/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

5

<b>Office Action Summary</b>	Application No. 10/669,055	Applicant(s) NODA ET AL.	
	Examiner Maureen G. Arancibia	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 July 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2 and 4-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1, 2, 6, 14, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,267,075 to Moffat et al. (from Applicant's IDS) in view of U.S. Patent 6,835,279 to Li et al. (U.S. '279)**

Moffat et al. teaches a plasma cleaning device for cleaning a process target 10 disposed therein with a plasma, comprising: a chamber 20; an exhaust mechanism 80 that lowers the chamber pressure below atmospheric pressure (Column 6, Lines 1-18); a process gas introducing mechanism 50 for introducing a process gas into the chamber (Figures 4 and 7; Column 5, Lines 32-48); an active plate electrode 32 and a grounded earth plate electrode 36, as broadly recited in the claim, housed in the chamber being disposed apart from one another in a facially opposing, generally parallel manner to define a plasma-producing space there between (Figure 7); a plasma generating power supply 102 connected to the active electrode for use in generating the plasma (Figures 4 and 7; Column 6, Lines 48-60 and Column 8, Lines 40-63); a disposing position of the process target 10 for disposing the process target outside of the plasma-producing space (in magazine 30; Figures 4 and 7); and an electrically

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conductive path connected to the target 10 via target holder 30, and provided with an auxiliary AC power supply applying a potential to the process target 10 via target holder 30. (Figures 4 and 7; Column 8, Lines 40-63).

Moffat et al. teaches that the earth electrode 36 is disposed between the active electrode 32 and the process target 10, and the active electrode 32 is disposed between the earth electrode 36 and the gas distribution plate 58. The gas distribution plate is disposed at the other side of the active electrode 32 from earth electrode 36, and is disposed apart from active plate electrode 32 in a facially-opposing, generally parallel manner with the active plate electrode to define an empty space there between. (Figures 4 and 7)

Moffat et al. does not expressly teach that the gas distribution plate 58 is conductive and electrically floating.

U.S. '279 teaches that a gas distribution plate 17 can be conductive and electrically floating. (Column 8, Lines 32-33; Column 9, Lines 65-66; Column 10, Lines 6-10; Column 14, Lines 17-34)

It would have been obvious to one of ordinary skill in the art to modify the teachings of Moffat et al. to have the gas distribution plate 58 be conductive and electrically floating, as taught by U.S. '279. The motivation for making such a modification, as taught by U.S. '279 (Column 14, Lines 29-34), would have been to lower the sheath voltage in the surface of the gas distribution plate, and thereby reduce contamination caused by the sheath voltage.

It has been held that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). Also, a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987) In this case, the gas distribution plate taught by the combination of Moffat et al. and U.S. '279, as a conductive, electrically floating plate, meets the structural limitation of a reflecting plate electrode, as broadly recited in Claims 18-20. This rejection is based on the fact the apparatus structure taught above has the inherent capability of being used in the manner intended by the Applicant. When a rejection is based on inherency, a rejection under 35 U.S.C. 102 or U.S.C. 103 is appropriate. (See *In re Fitzgerald* 205 USPQ 594 or MPEP 2112).

In regards to Claim 2, Moffat et al. teaches that the disposing position of the process target 10 is at the other side of the earth plate electrode 36 from the active plate electrode 32.

In regards to Claim 6, Moffat et al. teaches that the electrically conductive path is provided with an auxiliary AC power supply applying a potential to the process target 10 via target holder 30. (Column 8, Lines 40-63)

In regards to Claim 14, plural sets of the pair of opposite electrodes (32, 36 and 34, 38) and the disposing position of the process target (magazine 30 is configured to hold a plurality of process targets 10) are provided in a common chamber 20 (Figure 7),

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a space in the chamber is partitioned into subspaces for the sets so that a plasma is generated by each of the sets in a corresponding subspace independently of the other sets (Column 9, Line 6 - Column 10, Line 4), and the electrically conductive path is connected to the process target of each of the sets (via target holder 30; Figure 7).

In regards to Claim 16, the particular type of gas used is a process limitation rather than an apparatus limitation, and the recitation of a particular type of gas does not limit an apparatus claim, see *In re Casey*, 152 USPQ 235; *In re Rishoi*, 94 USPQ 71; *In re Young*, 25 USPQ 69; *In re Dulberg*, 129 USPQ 348; *Ex parte Thibault*, 64 USPQ 666; and *Ex parte Masham*, 2 USPQ2d 1647. This rejection is based on the fact the apparatus structure taught by Moffat et al. has the inherent capability of being used in the manner intended by the Applicant. When a rejection is based on the inherency, a rejection under 35 U.S.C. 102 or U.S.C. 103 is appropriate. (See *In re Fitzgerald* 205 USPQ 594 or MPEP § 2112).

In regards to Claim 17, an inlet port 60 for the process gas is provided to a vent pipe 84 of the chamber via plenum 50, as broadly recited in the claim. (Figure 4; Column 5, Line 32 - Column 6, Line 33)

**3. Claims 4, 5, and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moffat et al. in view of U.S. '279 as applied to Claim 1 above, and further in view of Japanese Unexamined Patent Application Publication 62-267483 to Ito et al. The following rejection refers to the English abstract and Figures of Ito et al.**

The teachings of Moffat et al. and U.S. '279 were discussed above.

In regards to Claims 4 and 5, the combination of Moffat et al. and U.S. '279 does not expressly teach that the auxiliary power supply is a variable DC power supply. In regards to Claims 10-12, the combination of Moffat et al. and U.S. '279 does not expressly teach that the auxiliary power supply can be provided with a protective circuit comprising a resistor and capacitor in parallel to each other and the auxiliary power supply.

Ito et al. teaches that an auxiliary power source 10 supplying a variable DC power (English abstract, Constitution) can be provided to a process target 5, with the power source 10 being provided with a parallel circuit of a resistor 9 and a capacitor 12 in parallel with each other. (Figure 1)

It would have been obvious to one of ordinary skill in the art to modify the teachings of the combination of Moffat et al. and U.S. '279 to include an auxiliary power source supplying a variable DC power, with the auxiliary power source being provided with a parallel circuit of a resistor and capacitor in parallel to each other and the auxiliary power supply. The motivation for doing so, as taught by Ito et al. (English abstract, Purpose), would have been to provide an auxiliary power circuit that prevents the substrate from being damaged.

**4. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moffat et al. in view of U.S. '279 as applied to Claim 1 above, and further in view of U.S. Patent 4,792,727 to Godyak.**

The teachings of Moffat et al. and U.S. '279 were discussed above.

The combination of Moffat et al. and U.S. '279 does not teach a resistor, diode, or both connected in series between the auxiliary power supply and process target, the diode oriented such that the process target side is the anode.

Godyak teaches that a diode D1 and resistor R1 can be provided in series between an auxiliary power supply 13 and an electrode A. (Figure 1)

It would have been obvious to one of ordinary skill in the art to provide a diode and resistor in series with the auxiliary power supply taught by the combination of Moffat et al. and U.S. '279, with the diode oriented such that the process target side is the anode. The motivation for providing the resistor, as would have come from within the knowledge generally available to one of ordinary skill in the art, would have been to control the amount of current provided to the process target. The motivation for providing a diode, as taught by Godyak (Column 2, Line 30), would have been that it is a unilateral conducting means; in other words, providing a diode allows the target to be biased. The motivation for orienting the diode such that the process target side is the anode, as would have come from within the knowledge generally available to one of ordinary skill in the art, would have been to increase the attraction of positively charged ions in the plasma to the target.

**5. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moffat et al. in view of U.S. '279 as applied to Claims 1 and 2 above, and further in view of U.S. Patent 6,178,919 to Li et al. (U.S. '919)**

The teachings of Moffat et al. and U.S. '279 were discussed above.



In regards to Claim 13, the combination of Moffat et al. and U.S. '279 does not expressly teach an insulating cover disposed in the chamber, covering the pair of opposite electrodes and process target, and having an opening to allow flow of the process gas.

U.S. '919 teaches that an insulating cover can be provided in a plasma chamber to confine the plasma to a specific volume, and dimensioned according to the volume needed, in order to make the etching by the plasma more uniform. (Column 7, Lines 60-66)

It would have been obvious to one of ordinary skill in the art to provide an insulating cover in the chamber taught by the combination of Moffat et al. and U.S. '279. The motivation for doing so, as taught by U.S. '919 (Column 7, Lines 63-66), would have been to prevent the plasma from grounding through the chamber walls. It would have been obvious to one of ordinary skill in the art to make the cover of a size to cover the pair of opposite electrodes and the target taught by Moffat et al. through routine experimentation to optimize the volume of plasma to be contained and the uniformity of the etching performed by the plasma. The motivation for providing an opening for the flow of process gas, as would have come from within the knowledge generally available to one of ordinary skill in the art, would have been to allow the process gas to reach the plasma electrodes.

**6. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moffat et al. in view of U.S. '279 as applied to Claim 14 above, and further in view**

**of Japanese Patent 2574852B2 (Japanese '852). The following rejection refers to the figures of Japanese '852.**

The teachings of Moffat et al. and U.S. '279 were discussed above. Moffat et al. teaches that the active electrodes 32, 34 are connected in parallel with each other to power supply 102. (Figure 7)

The combination of Moffat et al. and U.S. '279 does not expressly teach that each active electrode should be provided with a corresponding resistor.

Japanese '852 teaches that electrodes 11, 11a, 11c connected in parallel to each other and supplied with a power source 7 should each be provided with corresponding resistors 8b, 8a, 8c. (Figure 1)

It would have been obvious to one of ordinary skill in the art to modify the apparatus taught by the combination of Moffat et al. and U.S. '279 to provide each electrode with a corresponding resistor, as taught by Japanese '852. The motivation for doing so, as would have come from within the knowledge generally available to one of ordinary skill in the art, would have been to individually optimize the current flow to each electrode while only having to provide one power source.

### ***Response to Arguments***

7. Applicant's arguments with respect to the pending claims have been considered but are moot in view of the new ground(s) of rejection.

8. The Examiner does note in regards to Applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re*

*Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

### ***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

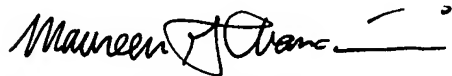
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maureen G. Arancibia whose telephone number is (571) 272-1219. The examiner can normally be reached on core hours of 10-5, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone

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number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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